
A LOWER DEVONIAN (ORISKANY) BRACHIOPOD WITH COLOR MARKINGS¹

JAMES L. MURPHY

Sears Library, Case Western Reserve University, Cleveland, Ohio 44106

ABSTRACT

A fragmentary brachial valve identified as *Prionothyris?* cf. *P. ovalis* (Hall), from the Oriskany sandstone of Oneida County, New York, retains traces of radial color-markings. It is noteworthy for being the first reported occurrence of color markings in the Family Centronellidae and one of the oldest-known brachiopods with preserved color markings. The fossil is preserved in the U.S. National Museum as no. 170563.

A brief visit to a Helderbergian limestone quarry, 0.7 mile north of Oriskany Falls, Oneida County, New York, in the fall of 1969 yielded the unusual brachiopod specimen illustrated in Figures 1 and 2. The shell was found in a large block of Oriskany sandstone at the top of the quarry wall. A section measured at this locality by Rickard has been published (Rickard, 1962) and the Oriskany described as "course, quartz sandstone, massive, fossiliferous," ten feet in thickness.

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The specimen bears two dark color bands, one on either side of the mid-line (figs. 1 and 2). They extend from the beak to the anterior margin, where they are about 3 mm wide and 4 mm apart. The color lines grow somewhat diffuse anteriorly, so that they cannot be measured precisely. The brachial valve is incomplete anteriorly, and the color markings, where cut by the break in the valve, appear to extend downward at least 0.5 mm into the shell, which is 1.0 mm thick at this point. The radial bands are a dark brownish-gray; the shell body is gray, with a slight brownish tinge.

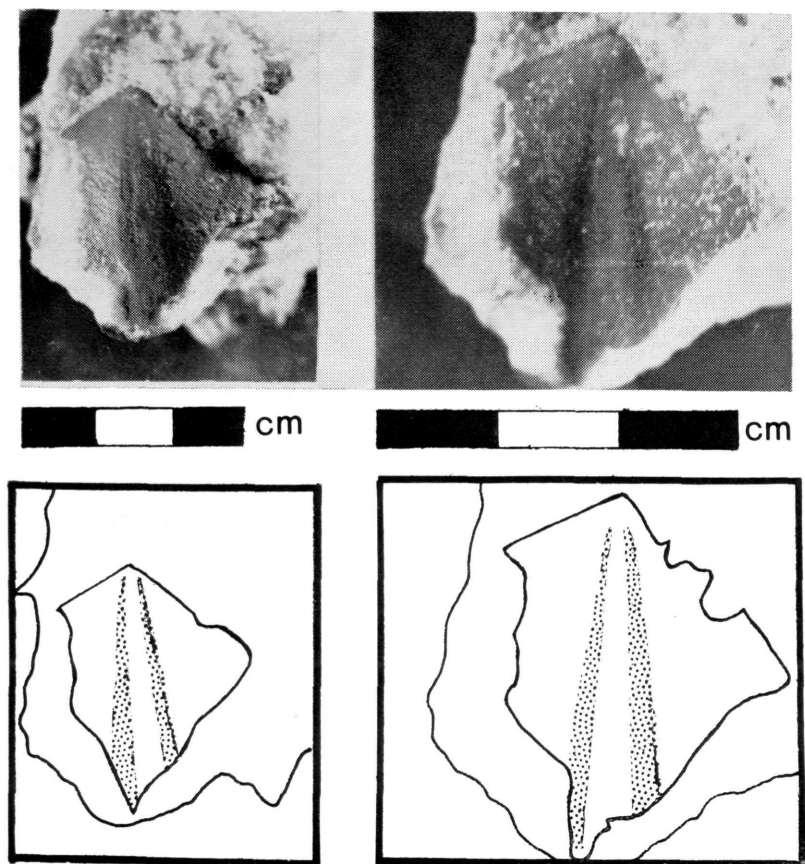


FIGURE 1. (left) *Prionothyris*? cf. *P. ovalis* (Hall). Natural size, USNM 170563 (Catalog No. 35).

FIGURE 2. (right) Same specimen, immersed in water, $\times 1.6$.

No internal features are revealed by this specimen, so that specific and even generic identification remain uncertain. The presence of fine anterior costellae and flattened, possibly introverted lateral margins suggests the subfamily Eurythyridinae, while general shell form and proportions suggest the genera *Beachia* and *Prionothyris*. The transverse outline and moderate convexity support tentative assignment of the specimen to *Prionothyris ovalis* (Hall). Although identification is not certain, recent faunal studies (Boucot and Johnson, 1967) indicate that *P. ovalis* and *P. perovalis* Cloud are the only eurythyridinids known from the "Big-Shell Community" of the New York Oriskany.

Similar radial color-markings have been described in several terebratuloid genera from middle Devonian strata. These genera are *Hamburgia* (Cloud, 1942), *Maclarenella* (Stehli, 1955), and *Cranaena* (Greger, 1908; Foerste, 1930; Cooper and Cloud, 1938; Cloud, 1941), all of which belong to the Family Cranaenidae. The only other known Paleozoic occurrences of radial color-markings are limited to *Dielasma* (Foerste, 1930; Kalashnikov, 1968), of Carboniferous age, also a member of the Cranaenidae. Radial color-markings have been previously unreported in the Suborder Centronellidina, although concentric color-markings are known in *Subrensselandia? cimex* (Cloud, 1942), a Devonian (post-Oriskany) stringocephalid member of the Centronellidina.

The only previously reported Lower Devonian occurrence of color preservation in brachiopods is an instance of subradial color-bands on a specimen of an indeterminate rhynchonellid from Arctic Canada (Boucot and Johnson, 1968). Color preservation is well documented in a variety of molluscs from considerably older rocks (Foerste, 1930), however, and collecting may eventually discover color markings preserved on pre-Devonian brachiopods.

The occurrence of color banding in a Oriskany brachiopod may be considered of some paleogeographic significance, for it has been interpreted to indicate deposition in relatively shallow water. Forbes (1844) seems to have been the first to have noted this possibility; he reports that modern color-marked forms became progressively more rare as water in the Mediterranean became deeper, this observation being supported by some quantitative data. Foerste (1930) appeared to accept this interpretation and has conveniently summarized the available information on this subject, but appears himself to have been averse to using any term more specific than "relatively shallow." Kalashnikov (1968), in a more recent discussion of this concept, concludes that such coloration is a result of cryptic (protective) adaption and believes that the relative depth of water may be inferred to some extent by the precise color of the markings, cinnamon or brick-red being most commonly observed in littoral or sublittoral species, with darker tinges being characteristic of deeper habitats.

The fossil is preserved as specimen no. 170563 in the U.S. National Museum.

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